भारतीय मानक
Indian Standard

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स्वचल वाहन — सुरक्षा पेटी, अंकुश प्रणाली एवं सुरक्षा पेटी चेतावनी — संस्थापन अपेक्षाएँ

Automotive Vehicles — Safety Belts, Restraint Systems and Safety Belt Reminder — Installation Requirements

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Passive Safety Crash Protection Systems Sectional Committee, TED 29

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Passive Safety Crash Protection Systems Sectional Committee had been approved by the Transport Engineering Division Council.

In the preparation of this standard considerable assistance has been taken from the following standards:

a) ECE Regulation No. 16-07 (upto Amd 01 dated 06.08.2013) — Uniform provisions concerning the approval of:

   1) Safety-belts, restraint systems, child restraint systems and Isofix child restraint systems for occupants of power-driven vehicles.
   2) Vehicle equipped with safety-belts, safety-belt reminder, restraint systems, child restraint systems and Isofix Child Restraint Systems.

b) ISO 2575 : 2010 Road vehicles — Symbols for controls, indicators and tell-tales.

Installation requirements of safety-belts, restraint systems and safety-belt reminder in vehicles are a safety requirement. This standard prescribes the requirements for such installation.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

AUTOMOTIVE VEHICLES — SAFETY BELTS, RESTRAINT SYSTEMS AND SAFETY BELT REMINDER — INSTALLATION REQUIREMENTS

1 SCOPE

This standard lays down requirements for safety-belts, restraint systems and safety-belt reminder for categories of Motor vehicles as defined in IS 14272 'Automotive vehicles — Types — Terminology (*first revision*)' as described below:

a) Vehicles of Category M and N with regard to the installation of safety-belts and restraint systems which are intended for separate use, i.e. as individual fittings, by persons of adult build occupying forward-facing seats

b) Vehicles of Category M1 with regard to safety belt reminder

c) The installation of safety belts or restraint systems other than those covered by this standard are allowed provided that they are intended for disabled people.

2 REFERENCES

The following standards contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

IS No.	*Title*
14272 : 2011	Automotive vehicles — Types — Terminology (*first revision*)
15139 : 2002	Automotive vehicles — Safety belt anchorages — Specification
15140 : 2003	Automotive Vehicles — Safety Belt Assembly — Specification
15223 : 2016	Automotive vehicles — Interior fittings — Specification (*first revision*)

3 TERMINOLOGY

For the purposes of this standard terms and definitions given in IS 15140 and the following shall apply:

3.1 Safety-Belt Reminder — Means a system dedicated to alert the driver when he/she does not use the safety-belt. The system is constituted by a detection of an unfastened safety-belt and by a driver's alert which is either a first level warning and/or a second level warning.

3.2 Visual Warning — Means a warning by visual signal (lighting, blinking or visual display of symbol or message).

3.3 Audible Warning — Means a warning by sound signal.

3.4 First Level Warning — Means a visual warning activated when the ignition switch is engaged (engine running or not) and the driver's safety-belt is not fastened. An audible warning can be added as an option.

3.5 Second Level Warning — Means a visual and audible warning activated when a driver operates a vehicle without fastening the safety-belt.

3.6 Safety-Belt is not Fastened — Means at the option of the manufacturer, either the driver safety-belt buckle is not engaged or the webbing length pulled out of the retractor is 100 mm or less.

3.7 Vehicle is in Normal Operation — Means that vehicle is in forward motion at the speed greater than 10 km/h.

4 APPLICATIONS FOR APPROVAL

4.1 The application for approval of a vehicle type with regard to the installation of its safety-belts and restraint systems shall be submitted by the vehicle manufacturer or by his duly accredited representative to the testing agency.

4.2 It shall be accompanied by the under mentioned documents and the following particulars:

a) Drawings of the general vehicle structure on an appropriate scale, showing the positions of the safety-belts, and detailed drawings of the safety-belts and of the points to which they are attached;

b) A specification of the materials used which may affect the strength of the safety-belts;

c) A technical description of the safety-belts; and

d) In the case of safety-belts affixed to the seat structure:

   1) Detailed description of the vehicle type

with regard to the design of the seats, of the seat anchorages and their adjustment and locking systems; and

2) Drawings, on an appropriate scale and in sufficient detail, of the seats, of their anchorages to the vehicle, and of their adjustment and locking systems.

4.3 A vehicle representative of the vehicle type to be approved or the parts of the vehicle considered essential for the safety-belt tests by the Testing Agency shall be submitted to the Testing Agency.

5 REQUIREMENTS CONCERNING THE INSTALLATION IN THE VEHICLE

5.1 Safety-Belt and Restraint Systems Equipment

5.1.1 The types of safety-belts or restraint systems for each seating position where installation is required shall be those specified in Table 1 of IS 15140.

In the case of seats, capable of being turned to or placed in other orientations designed for use when the vehicle is stationary, the requirements of **5.1** shall only apply, to those orientations designated for normal use when the vehicle is travelling on a road, in accordance with this standard.

5.1.2 On three point belts fitted with retractors, one retractor must operate at least on the diagonal strap.

5.1.3 Except for vehicles of category M1 an emergency locking retractor of type 4N may be permitted instead of a retractor of type 4 where it has been shown to the satisfaction of the testing agency responsible for the tests that the fitting of a type 4 retractor would not be practical.

5.1.4 For the front outboard and the front centre seating positions, lap belts fitted in accordance with Table 1 of IS 15140 shall be considered adequate only where the windscreen is located outside the reference zone defined in Annex A of IS 15223.

5.1.4.1 As regards safety-belts, the windscreen is considered as part of the reference zone when it is capable of entering into static contact with the test apparatus according to the method described in Annex A of IS 15223.

5.1.5 With the exception of the case covered by **5.1.6**, every passenger seating position which is fitted with an airbag shall be provided with a warning against the use of a rearward-facing child restraint in that seating position.

5.1.5.1 In the case of a frontal protection airbag on the front passenger seat, the warning shall be durably affixed to each face of the passenger front sun visor in such a position that at least one warning on the sun visor is visible at all times, irrespective of the position of the sun visor. The text size as applicable shall allow the label to be easily read by a normal sighted user seated on the seat concerned.

5.1.5.2 Alternatively, one warning shall be on the visible face of the stowed sun visor and a second warning shall be on the roof behind the visor, so, at least one warning is visible at all times. The text size as applicable shall allow the label to be easily read by a normal sighted user seated on the seat concerned.

5.1.5.3 In the case of a frontal protection airbag for other seats in the vehicle, the warning shall be directly ahead of the relevant seat, and clearly visible at all times to someone installing a rear-facing child restraint on that seat.

5.1.5.4 Examples of possible designs of pictogram are shown in Fig. 1. The overall dimensions shall be 120 mm × 60 mm or the equivalent area, as a minimum. One of the labels shown below may be adopted in such a way that the layout differs from the example below; however the content shall meet the above prescriptions. This label shall be provided at least in English.

5.1.5.5 Detailed information making reference to the warning, shall be contained in the owner's manual of the vehicle; as a minimum, the following text in Hindi or English shall at least include:

NEVER use a rearward facing child restraint on a seat protected by an ACTIVE AIRBAG in front of it, DEATH or SERIOUS INJURY to the CHILD can occur.

The text shall be accompanied by an illustration of the warning to be found in the vehicle.

The requirements of **5.1.5.5** do not apply to vehicles of which all passenger seating positions are equipped with a device which automatically deactivates the frontal protection airbag assembly when any rearward facing child restraint is installed.

5.1.6 The requirements of **5.1.5** shall not apply to seating positions equipped with a mechanism which senses automatically the presence of any rearward-facing child restraint, and ensures that the airbag will not be deployed when such a child restraint system is fitted.

5.2 General Requirements

5.2.1 Safety-belts, restraint systems, shall be fixed to anchorages conforming to the specifications of IS15139, such as the design and dimensional characteristics, the number of anchorages, and the strength requirements.

5.2.2 The safety-belts, restraint systems, shall be so installed that they will work satisfactorily and reduce the risk of bodily injury in the event of an accident. In particular they shall be so installed that:

5.2.2.1 The straps are not liable to assume a dangerous configuration.

5.2.2.2 That the danger of a correctly positioned belt slipping from the shoulder of a wearer as a result of his/her forward movement is reduced to a minimum.

5.2.2.3 The risk of the strap deteriorating through contact with sharp parts of the vehicle or seat structure is reduced to a minimum.

5.2.2.4 The design and installation of every safety-belt provided for each seating position shall be such as to be readily available for use. Furthermore, where the complete seat or the seat cushion and/or the seat back can be folded to permit access to rear of the vehicle or to goods or luggage compartment, after folding and restoring those seats to the seating position, the safety-belts provided for those seats shall be accessible for use or can be easily recovered from under or behind the seat, by one person, according to instructions in the vehicle users handbook, without the need for that person to have training or practice.

5.3 Special Requirements for Rigid Parts Incorporated in Safety-Belts or Restraint Systems

5.3.1 Rigid parts, such as the buckles, adjusting devices and attachments, shall not increase the risk of bodily injury to the wearer or to other occupants of the vehicle in the event of an accident.

FIG. 1 AN EXAMPLE OF A POSSIBLE DESIGN OF A PICTOGRAM

5.3.2.1 The device for releasing the buckle shall be clearly visible to the wearer and within his easy reach and shall be so designed that it cannot be opened inadvertently or accidentally. The buckle shall also be located in such a position that it is readily accessible to a rescuer needing to release the wearer in an emergency.

5.3.2.2 The buckle shall be so installed that, both when not under load and when sustaining the wearer's mass, it is capable of being released by the wearer with a single simple movement of either hand in one direction.

5.3.2.3 In the case of a safety-belts or restraint systems for front outboard seating positions, except if these are harness belts, the buckle shall also be capable of being locked in the same manner.

5.3.2.4 A check shall be made to ensure that, if the buckle is in contact with the wearer, the width of the contact surface is not less than 46 mm.

5.3.2.5 A check shall be made to ensure that, if the buckle is in contact with the wearer, the contact surface satisfies the requirements of **4.2.2.1** of IS 15140.

5.3.3 When the belt is being worn, it shall either adjust automatically to fit the wearer or be so designed that the manual adjusting device is readily accessible to the wearer when seated and is convenient and easy to use.

5.3.4 Safety-belts or restraint systems incorporating retractors shall be so installed that the retractors are able to operate correctly and stow the strap efficiently.

5.4 Safety-Belt Reminder Equipment

5.4.1 Where the vehicle manufacturer equips the driver seating position of M1 category of vehicles with a safety-belt reminder system the vehicle manufacturer shall have the option of providing any of the following:

a) First level Warning.
b) Second level Warning.

The safety-belt reminder system shall satisfy the requirements of **5.4.2**.

5.4.1.1 The deactivation of the safety-belt reminder may be allowed, provided that such deactivation satisfies to the requirements of **5.4.2.6**.

5.4.2 *Safety-Belt Reminder*

5.4.2.1 *General requirements*

5.4.2.1.1 Visual warning shall be so located as to be readily visible and recognisable in the daylight by the driver and distinguishable from other alerts. Where the visual signal warning employs the colour red, it shall use a symbol as shown in Fig. 2.

5.4.2.1.2 Visual warning shall be by continuous or intermittent signal.

5.4.2.1.3 Audible warning shall be by continuous or intermittent sound signal or by vocal information. Where vocal information is employed, the manufacturer shall ensure that the alert uses the language either English or Hindi. This audible warning may be constituted by more than one step.

5.4.2.1.4 Audible warning shall be easily recognized by the driver.

5.4.2.2 First level warning shall be at least a visual warning activated for 4 seconds or longer when the driver safety-belt is not fastened and the ignition switch is engaged.

5.4.2.3 The activation of the first level warning shall be tested according to the test procedure defined in Annex A (*see* **A-1**).

5.4.2.4 Second level warning shall be a visual and audible signal activated for 30 s or longer except for cases in which the warning stops for over 3 seconds when the safety-belt is not fastened, when the vehicle is in normal operation and when at least one of the following conditions (or any combination of these conditions), is fulfilled:

a) Distance driven greater than the distance threshold. The threshold shall not exceed 500 m. The distance the vehicle is not in normal operation shall be excluded.
b) Speed greater than the speed threshold. The threshold shall not exceed 25 km/h.
c) Duration time (engine running) greater than the duration time threshold. The threshold

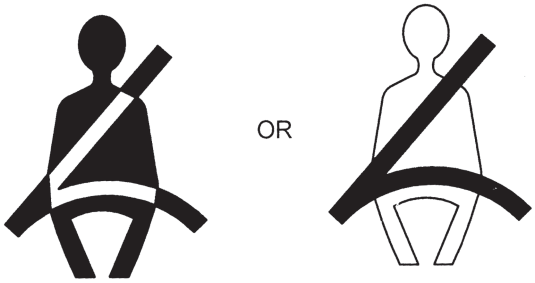

FIG. 2 VISUAL WARNING

shall not exceed 60 s. The first level warning duration time and the duration time the vehicle is not in normal operation shall be excluded.

5.4.2.5 The activation of the second level warning shall be tested according to the test procedure defined in **A-2**.

5.4.2.6 The safety-belt reminder may be designed to allow deactivation.

5.4.2.6.1 In the case a short term deactivation is provided, it shall be more difficult to deactivate the safety-belt reminder than buckling the safety-belt on and off. When the ignition is switched off for more than 30 min and switched on again, a short-term deactivated safety-belt reminder must reactivate.

5.4.2.6.2 In the case that a facility for a long term deactivation is provided, it shall require a sequence of operations to deactivate, that are detailed only in the manufacturer's technical manual and/or which requires the use of tools (mechanical, electrical, digital, etc) that are not provided with the vehicle.

ANNEX A

(*Clause* 5.4.2.3)

SAFETY-BELT REMINDER TESTS

A-1 The first level warning shall be tested according to the following conditions:

a) Safety-belt is not fastened;
b) Engine is stopped or idling and the vehicle is not in forward or reverse motion;
c) Transmission is in neutral position;
d) Ignition switch is engaged.

A-2 The second level warning shall be tested according to the following conditions:

a) Safety-belt is not fastened;
b) Test vehicle driven with one or any combination of the conditions of described in **A-2.1** to **A-2.3** at the manufacturer's choice.

A-2.1 Accelerate the test vehicle to 25^{+10}_{-0} km/h from a halt and continue on the same speed.

A-2.2 The test vehicle is driven forward at least 500 m from a halt position.

A-2.3 The vehicle is tested when the vehicle is in normal operation for at least 60 seconds.

A-3 A system that the first level warning stops after a certain period of time, the second level warning shall be tested according to **A-2** after the first level warning has been deactivated. A system that the first level warning does not stop after a certain period of time, the second level warning shall be tested according to **A-2** while the first level warning is activated.

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